for example, who read in the Africa volume Mr. Basil Worsfold's interesting and valuable statement of native problems in South Africa will be able to read them in the light of the observations made by Mr. E. B. Sargant in the chapter on educational problems of the Empire, culminating in the reflection that where there are two distinct social orders, of which one represents largely the hewers of wood and drawers of water, "any neglect of the development of the more backward, group must react unfavourably upon the development of the other, and ultimately leave its mark upon the whole Empire" (General Survey, p. 233), as, on the other hand, those who read these highly general observations will have the advantage of considering them in the light of the more concrete presentments of fact elsewhere.

While there is so much to be thankful for in these volumes there are nevertheless one or two things to regret. To begin with a minor matter, it may be pointed out that some of the maps and diagrams are not so completely self-explanatory as one would like them to be. Thus, in the map of the "Economic Regions of Canada" in the America volume, it is not clear what territory the so-called "Central Agricultural Region" is intended to include. In the map of the "Railways of Eastern Canada," p. 189, there seems to be some mistake in the reference. In the very interesting rainfall diagram on p. 334, as on that of the monthly discharge of the Nile on p. 345, it would be well to add at least the latitudes of the places mentioned. In the former, for example, the contrast between Wadelai and Ghaba Shambe would be all the more striking if we knew that there there is only 4° of latitude between the two places, a fact which there is no means of finding out from the book, inasmuch as Ghaba Shambe is not named on the map of north-east Africa, between pp. 316 and 377.

Then, further, it is both surprising and regrettable that in a work coming out virtually under the auspices of the Oxford School of Geography there should have been apparently so little systematic endeavour to give prominence to geographical influences. Even in the section on the British Isles, a good deal more space is given to the administration of towns than to the conditions that tend to fix their sites and promote their growth. In the Australasia volume there is indeed a deliberate effort to develop those influences in the chapter on physical geography, but this attempt, to our mind, suffers somewhat from the prominence given to geological history in setting forth those influences. The sentences in this chapter may in many cases be individually interesting, but the reading of a paragraph, notwithstanding the illustration by block diagrams, is often hard, that of a sequence of paragraphs still more so.

But there is one chapter conspicuously free from this fault, a chapter by an unnamed writer in which what may be called the geography of British policy and of British strategy is expounded in such illuminating fashion that the most ignorant under this head will be enlightened, a chapter which will be read in present circumstances with the keenest interest, and for the sake of which alone it would be worth while for anyone who has fourteen shillings to spare to buy the volume—that containing the general survey, an admirable volume in other respects. We may conclude this review with a quotation from the chapter (p. 190), which all of us may ponder with profit at the present time:—

"The geographical situation of the British Isles confers certain advantages from the point of view of waging offensive warfare. It greatly facilitates the protection of our oversea trade against an enemy that is compelled to issue from the North Sea to gain access to the Atlantic, and it enables us to keep the ports on the other side of the Channel under effective observation should necessity to do so arise. But against those advantages must be weighed those conferred by a possible enemy for waging warfare by the double exit from the Baltic *viâ* the Kiel Canal and the Skaggerak. This double exit not only increases the difficulty of maintaining effective observation on any hostile fleet that can make use of either passage, but imposes upon us the necessity of keeping our main fleet in a position from which it can ensure bringing the enemy to action before he can break out of the North Sea, and in certain circumstances might prevent any division of the battle fleet."

G. G. C.

## POPULAR NATURAL HISTORY.

(1) *The Courtship of Animals.* By W. P. Pycraft. Pp. xvi+318+40 plates. (London: Hutchinson and Co., 1913.) Price 6*s.* net.

(2) *Hunting the Elephant in Africa and other Recollections of Thirteen Years' Wanderings.* By Captain C. H. Stigand. With an Introduction by Colonel Theodore Roosevelt. Pp. xv+379+plates. (New York: The Macmillan Company; London: Macmillan and Co., Ltd., 1913.) Price 10*s.* 6*d.* net.

(3) *Gardens of the Great Mughals.* By C. M. Villiers Stuart. Pp. xviii + 290 + plates. (London: A. and C. Black, 1913.) Price 12*s.* 6*d.* net.

(4) *Ce que j'ai vu chez les bêtes.* By Paul Noël. Preface de G. Colomb. Pp. 343. (Paris: Librairie Armand Colin, 1913.) Price 3.50 francs.

(5) *Cassell's Natural History.* By F. Martin Duncan. Pp. xx + 432 + plates. (London: Cassell and Co., Ltd., 1913.) Price 9*s.* net.

(6) *Animals of the Past: An Account of Some of the Creatures of the Ancient World.* By F. A. Lucas. Pp. xx + 266 + plates. (New York: American Museum of Natural History, 1913.)

(7) *Butterflies and Moths in Romance and Reality.* By W. F. Kirby. Pp. 178 + 28 plates. (London: S.P.C.K., 1913.) Price 5*s.* net.

(8) *Common British Moths.* By A. M. Stewart. Pp. viii + 88 + 15 plates. (London: A. and C. Black, 1913.) Price 1*s.* 6*d.* net.

(1) MR. PYCRAFT has written a very interesting comparative study of the love-making of a great range of animals selected from most of the main zoological groups. The explanation given by Darwin as to the origin of the secondary sexual characters is now, he answers, rather out of date, and Wallace's "arguments for sexual selection are far from convincing and often inconsistent." The "theme" of the book is to show that a sharp line must be drawn between those attributes which are necessary to achieve individual survival and those to achieve the survival of the race-factors which, in the latter, are embraced under sexual selection. Much, Mr. Pycraft believes, hitherto attributed to the action of sexual selection alone—such as the behaviour of animals during sexual activity and the colours they display at this season—is largely governed by the action of "hormones" (the secretions of various ductless glands in the body). "Suggestion" is also necessary, but "suggestion does not suggest" till the hormones have rendered the system inflammable; "suggestion by display" of some kind, as an aphrodisiac, is a necessity, or "how else can desire be indicated? Here is sexual selection." The limits of space assigned to us forbid our discussing this question —which is very interesting, but perhaps less entirely novel than the author realises—beyond mildly "suggesting" that Mr. Pycraft's system seems so saturated by one or more hormones as to "exalt" his particular point of view somewhat at the expense of others. We heartily recommend the book, nevertheless. It contains eighty illustrations on art paper.

(2) Captain Stigand is a well-known African official, devoted to hunting, who always provides his readers with an entertaining, well-written story. The unending stream of books on big-game hunting has, however, now made us fairly intimately acquainted with the lives and artifices of both the hunter and the hunted, so that from this point of view the author's elephant-hunting episodes are less interesting to the general student of nature than the discussion we have in his book upon protective coloration applied to big game. Mr. Roosevelt, in a foreword to the volume, avers, in his usual strenuous language, that the extreme theories of Poulton and Thayer "on this subject" have no bases whatever "in fact," and Mr. Wallace has "strained the recognition-mark theory to an impossible point," but that Captain Stigand's observations now leave "no excuse for further mistakes in the matter." But for the editorial fiat as to space, we are of opinion that it might still be shown that "all is not yet up" with the earlier theories. We can only refer those interested in the subject to the book, to wrestle out the matter for themselves.

(3) Mrs. C. Villiers Stuart's pages form charming memorials of the wonderful old, beflowered, and be-avenued gardens of the Indian emperors, with their warbling fountains and their running waters, so delicious to eye and ear in a parched land. She describes them not only in choice and delicate language, but depicts them in water-colours of great beauty and charm. One of the author's objects, apparently, in writing this book has been to give expression to the hope that in the New Delhi similar gardens may be reproduced. This is a delightful vision; but we greatly fear that the romance that haloes the Mughals and the beauties of their harems, of whom these walled pleasaunces were the shady ambulatory, cannot be revived in our days, and be the gardens of New Delhi never so gay and be-fountained, they will never reproduce those delightful enclosures as they appear to us through the sunlit haze of four hundred years.

(4) We have found the little book by M. Paul Noël, director of the Laboratory of Agricultural Entomology of the Seine-Inférieure, with the quaint title of "Ce que j'ai vu chez les bêtes," very delightful reading. It is written in the very simple, elegant, but exact language for which French scientific writers are so distinguished, and deals with a large number of the common insects, birds, reptiles, and mammals of the country. The author describes and figures several very admirable automatic appliances—for catching insects, rearing larvæ, and other purposes—invented by him in the course of his experiments and observations. Had it not a better use, it would form a very excellent French primer for young nature students.

(5) Mr. F. Duncan's book may be called a digest of the several volumes of the well-known "Cassell's Natural History," by the late Dr. P. Martin Duncan, although to attempt to deal adequately with the whole animal kingdom, as is done here, in a comparatively small volume, is,

we think, an over-bold adventure. The space allotted to manv of the phyla is disproportionate to their importance. It is somewhat difficult to form an opinion of the class of reader for whom this book is intended, for we think that neither the general reader interested in natural history, nor the serious zoologist in need of a book of reference, will find it very satisfactory. The volume is well illustrated by 200 photographic reproductions.

(6) Mr. Lucas, the director of the American Museum of Natural History in New York, gives in this volume an account of a number of the most striking prehistoric animals on view in that institution, to the library of handbooks of which it forms a valuable addition. The author's name is sufficient guarantee for the accuracy of its contents; and Mr. Knight's—an artist well known for his skill in depicting prehistoric animals—for the restorations provided in it. Biographical references are appended to each chapter, and there is a sufficient index.

(7) This is a posthumous volume by Mr. W. F. Kirby, well known by his entomological work. As a general account of the lepidoptera the volume will be found accurate, and written in a more than usually interesting style. It is well illustrated by twenty-eight very excellent coloured plates, "made in Germany."

The last volume (8) on our list, one of the "Peeps at Nature" series, dealing only with our common British moths, is more sketchy than Mr. Kirby's. The colour photographs with which it is illustrated are, however, specially good.

## ELECTRICAL ENGINEERING.

(1) *Telegraphy.* By the late Sir W. H. Preece and Sir J. Sivewright. Revised and partly rewritten by W. L. Preece. Pp. x+422. (London: Longmans, Green and Co., 1914.) Price 7*s.* 6*d.* net.

(2) *Continuous and Alternating Current Machinery.* An Elementary Text-book for use in Technical Schools. By Prof. J. H. Morecroft. Pp. ix+466. (New York: J. Wiley and Sons, Inc.; London: Chapman and Hall, Ltd., 1914.) Price 7*s.* 6*d.* net.

(3) *Laboratory Manual, Direct and Alternating Current.* Prepared to accompany Timbie's "Elements of Electricity." By C. E. Clewell. Pp. vii+100. (New York: J. Wiley and Sons, Inc.; London: Chapman and Hall, Ltd., 1914.) Price 4*s.* 6*d.* net.

(4) *Transmission Line Formulas for Electrical Engineers and Engineering Students.* By H. B. Dwight. Pp. vi+137. (London: Constable and Co., Ltd., 1913.) Price 8*s.* 6*d.* net.

(5) *Wireless Telegraphy.* A Handbook for the Use of Operators and Students. By W. H. Marchant. Pp. xi+241. (London: Whittaker and Co., 1914.) Price 5*s.* net.

(6) *Incandescent Electric Lamps and Their Application.* By Daniel H. Ogley. Pp. x+107. (London: Longmans, Green and Co., 1914.) Price 2*s.* 6*d.* net.

(1) A BOOK based on the immense experience of the late Sir Wm. Preece could scarcely fail to be of the greatest value to telegraphists at large; when, in addition, it has passed through edition after edition for nearly forty years, it is almost superfluous for a reviewer to give either praise or blame. The present edition has been again revised and brought up to date; it has been recast into a larger size of page, which we consider an improvement.

For those who are now beginning their subject we would say that the work aims at describing the simpler methods of land telegraphy, and includes the principles of duplex, quadruplex, and multiplex working, besides the elements of telephone exchange system. There are thoroughly practical chapters on materials and outdoor construction, besides information as to faults and tests. With scarcely an exception, the descriptions are lucid and clear; the literary style is pleasing, padding is absent, and practice lives on every page.

Submarine telegraphy is not included, being regarded as beyond the range of the book. We think it would have been well if wireless had been treated in the same way, as the chapter on this subject (the last one) does not give the reader the same grasp of essentials that the remainder of the book does.

(2) After a careful study of this excellent text-book, any intelligent engineer or engineering student ought to have a good general knowledge of the various kinds of electrical machinery now in use. Although the treatment is of an elementary kind and includes very few formulas, it is very thorough. It discusses all the essential actions in the more important machines very clearly, and includes many useful points which are seldom to be found in text-books. It is somewhat unfortunate that in the preliminary discussions given in the first few chapters the author has chosen entirely to ignore certain facts, and so gives the student a false impression, which he has to correct when the full discussion is reached later on. Thus, the reader to whom the matter is new would probably gather from p. 20 that magnetic hysteresis is the only source of loss in